

Et's Skeg: the full story

Having used pie-slice skegs on mass-market boats with big floppy slots and finding them ok, but not ideal, I researched a bit online looking for a skeg or skeg design for my North Star. I didn't want to install a junk skeg on a very nice boat so I ended up buying one of the Onno foil skegs, and after much deliberation, actually installing it.

The Onno skeg went in easily and, in operation, works very well in every respect and I can't fault it for performance or craftsmanship. It was, however, expensive, and the reasons I had for the deliberation in fitting it still niggled. They are: firstly, that the hinging arrangement, that is necessary for these foiled skegs to deploy, necessitated a widening in the skeg-box to allow it to fit inside at all, and second, that the axel bolt is not waterproof, and needs rubber washers (possible pinching problems), or goop of some sort to waterproof it.

I decided in the end to put epoxy lumps over the bolt head and nut. Not at all ideal if it has to be removed, especially in an expedition scenario.

So my mission for the home made skeg was as follows....

- 1) I like the foil shape so this was nonnegotiable.
- 2) it must be housed in a narrow, low-drag slot no wider than one cm (the width of the fin being 9mm) with no additional widening for hinges.
- 3) it must be easily removed in the field with little fuss and without requiring surgery of any kind.
- 4) it must be totally waterproof in every respect, including axel points, cable-hose, and possible moisture ingress to the timber at the hull join or anywhere else in the casing.
- 5) it must be as light as possible.

If I was not able to fulfill all of the above criteria I would live without it.

I decided on cable rather than rope on the KISS principal.

Before I continue I should mention here that I have no concerns about sand or pebbles jamming up the works in the narrow slot. I rarely paddle off beaches and in any case I think the argument may be a little spurious and perhaps an excuse for not taking enough trouble on the tolerances of the slot.

For those who are too lazy to read further, the pics more or less describe the job.

The process:

The skeg was the point of the exercise, so I fashioned that first, deciding on a size and shape that I liked. To keep it light I made it up out of cedar strips 8mm wide, shaped the foil, and covered it with glass and epoxy.



The hinge arrangement had to fit inside the casing so was added next. This hinge needed to operate freely in a width less than one cm. For this I used a small length of SS shroud-plate and an item called a swaged-terminal-eye, which would hold the cable. The hinge pin is a length of clevis pin tapped over with a hammer to form a rivet. The shroud plate was seated in thickened epoxy in a mortise in the fin.



I now had the skeg and its moving parts so I was able to design the casing to fit as snugly as possible.

I had no ply on hand, so the casing side-walls were glued up from cedar strip and sanded. To get a perfectly flat sheet I laid up the strip epoxy/glass sandwich between two sheets of glass (I have an old shower door for this). I wet out a square of 6 oz cloth on a sheet of glass, laid the strip square on it, wet out another square of cloth, laid that down, then another sheet of glass and then weights, and then let it set.



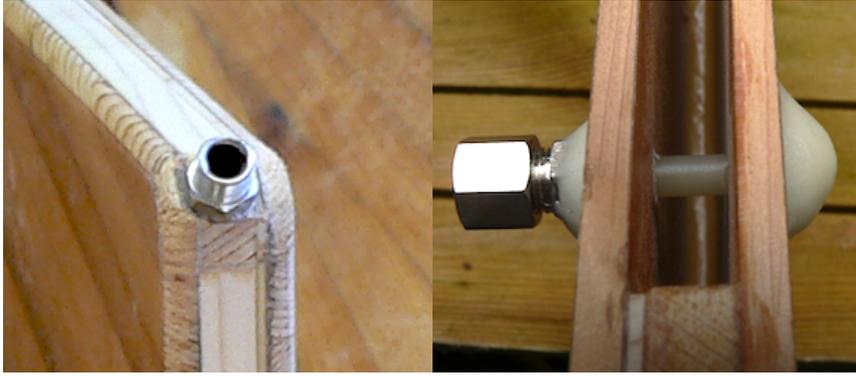
The axel holes were drilled out oversized and filled with epoxy and microfibres then re-drilled after the box was put together for the axel pin.

The slot spacers are pine. They are 11mm thick.



The box was glued up then cleaned up and the outside edges and corners rounded off with a router.

A slightly oversize hole was drilled for the plastic cable hose and a slightly larger entry hole for the compression fitting for the hose (below left).



A small length of hose with plenty of thickened epoxy was inserted through the corner of the case and the compression fitting then added (without the compression ring) and bedded down in epoxy too. I had a drill bit inside the hose to keep it nice and straight while the epoxy set.

When the epoxy was set I pulled out the bit of hose.

I moulded a lump of thickened epoxy over the axel point on one side of the box.

I drilled a slightly oversized hole half way through the previously filled axel hole on the other side of the box and glued in a second compression fitting (above right) (Compression fittings and Cable casing from <http://www.karitek.co.uk>)

After it is all set up it is easy to drill a hole for the axel pin, being careful not to penetrate through the lump on the other side of the box.

That was the box done.

A length of sanding belt in the bottom of the keel made it easy to get the skeg-box shaped to fit nicely in the bottom of the boat.



To cut a slot hole in a perfectly good keel I drill through the ends of the slot and (I use a Japanese saw) cut out the slot in the hull, but not the full width of the casing slot. I leave it a mm or so too narrow.



I roughed everything up and glued in the casing, taking care to get it vertical, and put in the fillet.

I then put bias cut cloth over the fillet (while still a bit soft) and the top and sides of the casing to complete waterproofing and strengthening.



Next, the boat was turned over and, using a strip of sandpaper wrapped around the right width of wood, I slowly widened the slot until the hull opening exactly matched the inside walls of the casing. This action also keyed the first three quarter inch or so of the inside of the casing which is good.

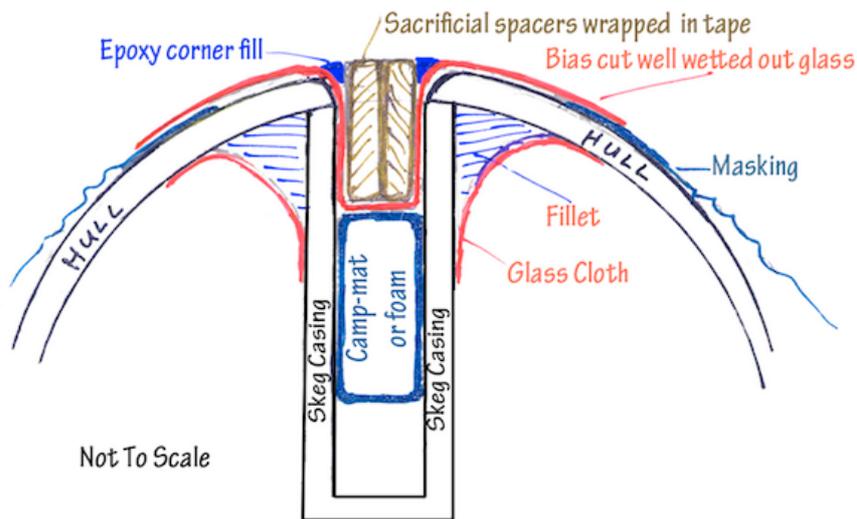
The next steps are necessary for worry free waterproofing... I am also moving from narrative form to instructive mode.

Round over the edges of the slot slightly so that glass cloth will lay over them.

Cut a one inch section of camp-mat or similar the exact size of the slot, cover it with brown packing tape, and gently squeeze it into the slot so that the top of it ends up about three quarters of an inch down below the surface of the slot. Make sure it completely seals the slot so that no epoxy can run down past it. If there are gaps at the ends they can be filled with a tiny amount of thickened epoxy when laying in the glass.

Mask off About an inch around the slot and lay a well saturated rectangle of bias cut cloth over the hole.

Using two bits of strip side by side, cut and shaped to the length of the slot and covered with packing tape to measure exactly 10 mm wide, gently push the cloth down into the slot until it is pressed against the camp-mat below, heat a little with a heat gun to get the epoxy to run well into the sides and dribble more in if bubbles emerge. brush the cloth over onto the masked area for trimming later and dribble epoxy into the area between the edges of the slot and the strips to fill in most of the round over on the corner.



Leave it all in place and allow the whole mess to go off, trim the cloth at the masking, and add fill coats to suit.

When all is well set carefully drill out along the middle between the two sacrificial bits of strips and extract the splinters from the slot, then dig out the bit of camp-mat.

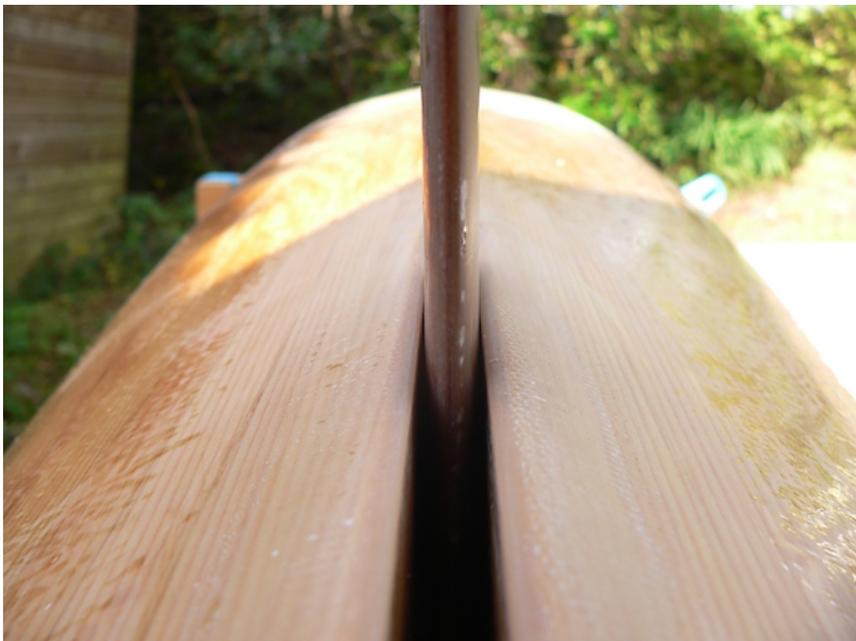


Gently chisel and sand off the edges of the glass that remain down inside the slot

and clean up at the hull edges.



The reason that the casing spacers are 11mm not 10mm is to allow for the width of the cloth in the previous step.



Hey presto, a neat and bombproof, waterproof skeg-box in a wooden boat.